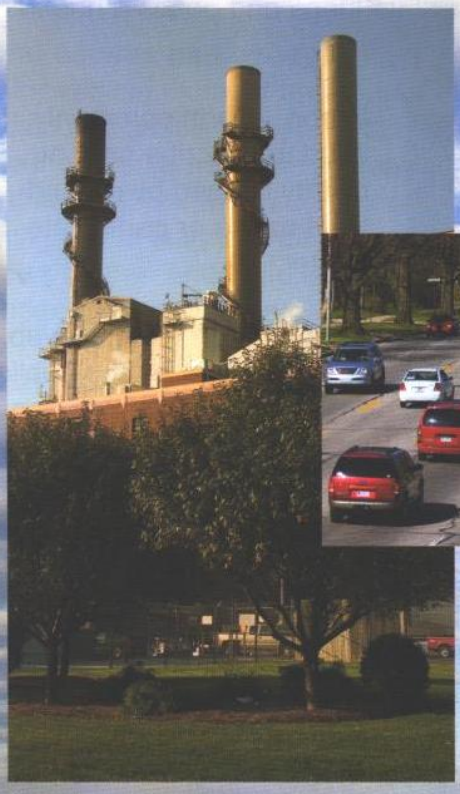
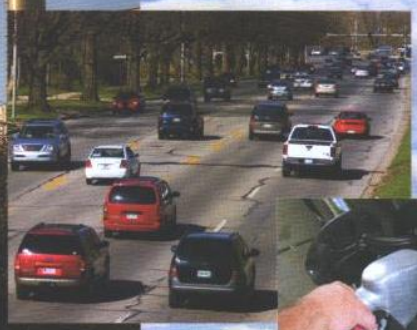
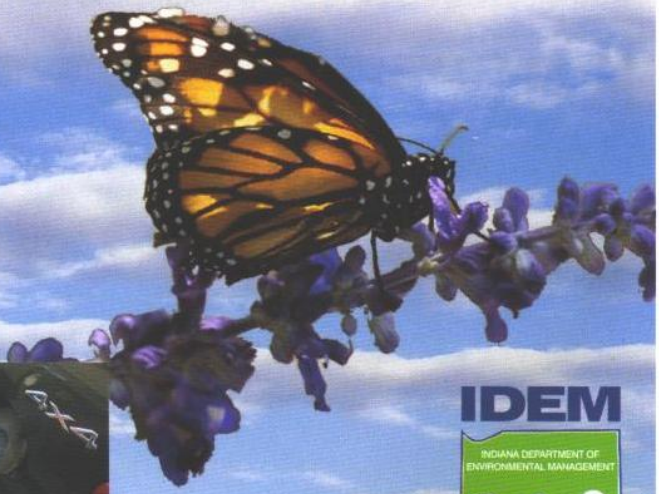
OZONE

INFORMATION







IDEM

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

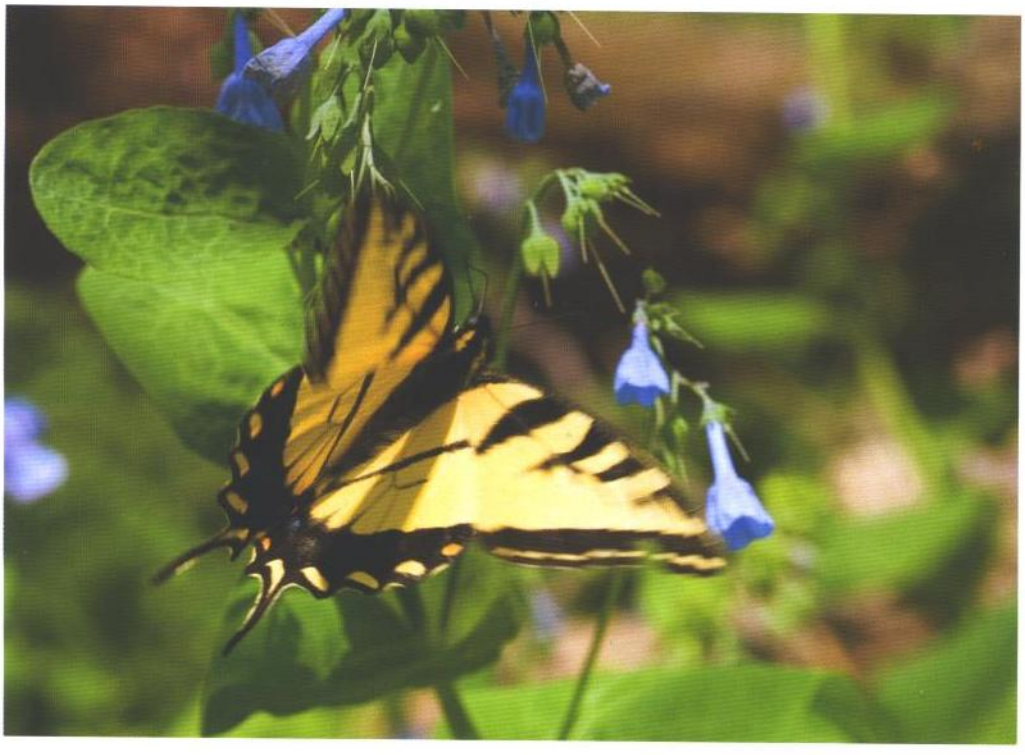
EST. 1986

IDEM's approach to air quality
The Indiana Department of Environmental Management (IDEM) works to improve air quality in Indiana by implementing federal and state air quality regulations. By issuing permits, providing compliance assistance, conducting inspections, offering incentive programs and creating materials for educational outreach, the agency protects human health from poor air quality.

IDEM, in coordination with local air pollution control agencies, monitors air quality in Indiana. Data collected from 41 Indiana ozone monitoring sites is evaluated and shared with the United States Environmental Protection Agency (U.S. EPA).

When air quality might reach levels that may affect public health, IDEM calls an Air Quality Action Day (AQAD). These public alerts are available on the SmogWatch Web site or toll free (800) 631-2871. SmogWatch AQAD alerts can be received via e-mail.

IDEM's daily air quality forecasts and SmogWatch AQAD alert signup are available at www.smogwatch.IN.gov .



AirNow – U.S. EPA Web site that provides the public with access to national air quality information. www.airnow.gov

Air Quality Action Day (AQAD) – A forecast to alert the public that air quality may affect health. IDEM issues alerts to local officials, media and citizens via press releases and e-mail messages.

Local air pollution control agency – Local government agencies authorized by IDEM to issue air permits, conduct compliance inspections, conduct air monitoring or carry out regulatory actions at the local level on behalf of the state. Vigo County, Anderson, Evansville Gary, Hammond and Indianapolis all have a local air pollution control agency.

Monitor – Equipment used to measure air quality.

Ozone or ground level ozone (O_3) – A gas in the atmosphere formed when nitrates of oxygen (NO_x) and volatile organic compounds (VOCs) combine when exposed to sunlight. Ozone can irritate lungs and poses a health concern.

Smog – Term commonly used to describe poor air quality caused by ground-level ozone or particulate matter.

SmogWatch – IDEM Web site that provides the public with easy access to Indiana's air quality information. www.smogwatch.IN.gov

Ozone

What is ozone?
Ozone (O_3) is a gas that forms in the atmosphere when 3 atoms of oxygen are combined. Ground-level ozone is commonly referred to as smog.

Ground-level ozone is not emitted directly into the air. Stagnant air allows nitrogen oxides (NO_X) and volatile organic compounds (VOCs) to react to sunlight and form ozone. Ozone is only a concern in the summer because a large amount of sunlight is needed to start the reaction.

Don't we want to save ozone?
Ozone has the same chemical structure whether it occurs high above the Earth or at ground-level and can be either "good" or "bad" depending on its location in the atmosphere. "Good" ozone occurs naturally in the stratosphere approximately 7 to 10 miles above the Earth's surface and forms a layer that protects the Earth from the sun's harmful rays. In the Earth's lower atmosphere, ground-level ozone is considered "bad" because it can cause adverse health effects.

What causes bad ozone?
Motor vehicle exhaust and industrial emissions, gasoline vapors and chemical solvents are some of the major sources of NO_x and VOCs, which combine to form ozone. Sunlight and stagnant air cause ground-level ozone to form and build up to harmful concentrations in the air.

What are the health effects of ozone?
Ozone can irritate lung airways and cause lung inflammation. Symptoms include wheezing, coughing, chest pain during deep breaths and breathing difficulties during exercise or outdoor activities.

Exposure to ozone has been linked to significant health problems, including aggravated asthma, increases in respiratory symptoms like wheezing and coughing, chronic bronchitis and decreased lung function.

Even at low levels, ozone can trigger health problems. These health effects are of concern to everyone who works, plays or spends time outdoors. People with respiratory problems, children and the elderly are most vulnerable, but even healthy people who are active outdoors can be affected by ozone.

How does IDEM measure air quality?
Each day, air quality data is collected from a network of air monitoring stations located across the state. When data from these monitors indicate conditions that can create unhealthful levels of ozone, IDEM will call an Air Quality Action Day (AQAD) to alert the public to take precautions and avoid ozone-generating activities until the health threat has passed. IDEM works with TV, radio and newspapers media sources to inform the public about an AQAD.

How can I protect myself from ozone?
Listen for AQAD alerts through your local media. To get air quality information directly from IDEM, sign up for SmogWatch e-mail alerts at www.smogwatch.IN.gov .

As a precaution, avoid physical exertion whenever ozone levels are high. This is especially important for children, the elderly and people with lung and heart diseases. When possible, limit outdoor activities and stay indoors when air quality is poor.

Ozone

Pollutant	Symbol	Major Man-made Sources	Human Health & Welfare Effects	Control Methods
Ozone (Smog) A colorless or bluish gas	O_3	Formed by a chemical reaction between volatile organic compounds (VOCs) and nitrogen oxides (NO_x) in the presence of sunlight Motor vehicle exhaust, industrial emissions, gasoline storage transport, solvents, paints and landfills	Irritates and causes inflammation of the mucous membranes and lung airways; causes wheezing, coughing and pain when inhaling deeply; decreases lung capacity; aggravates lung and heart problems Damages plants; reduces crop yield Damages rubber, some textiles and dyes	Pollution control equipment; reducing NO_x emissions from power plants and industrial combustion sources; introducing low-emission cars and trucks; using "cleaner" gasoline; use of low VOC solvents
Volatile Organic Compounds	**VOCs**	Motor vehicle exhaust, solvents, aerosol sprays and industrial processes	Eye, nose and throat irritation; Headaches, allergic skin reaction and dizziness	Use of paints, solvents and surface coatings that contain fewer VOCs; emission controls on motor vehicles; industrial practices that lower VOC emissions
Nitrogen Oxides A reddish-brown gas	**NO_x**	Combustion in motor vehicles, industrial sources, electric utilities and other sources that burn fuel	Respiratory irritant; aggravates lung and heart problems; Precursor to ozone and acid rain; Contributes to global warming and nutrient overloading which deteriorates water quality; Causes brown discoloration of the atmosphere	Exhaust gas recirculation in motor vehicles; reduction of combustion temperatures in industrial sources; energy conservation; pollution control equipment

VOCs + NO_x + Sunlight = OZONE

Ozone forms when VOCs and NO_x react to each other in sunlight. Slow wind patterns keep ozone near the ground, where it can build up over several days. Ozone levels are monitored from April through September in Indiana.

AIR QUALITY INDEX

The Air Quality Index rates the air quality of a particular region based on the forecasts made for ozone, fine particulate matter, carbon monoxide, sulfur dioxide and nitrogen dioxide. The forecast levels are color coded to indicate the potential health impact. Compare the daily air quality forecast in your region on www.smogwatch.IN.gov with the chart below to see how ozone may affect you.

LEVELS OF HEALTH CONCERN	CAUTIONARY STATEMENTS
GOOD	Air quality is considered satisfactory and air pollution poses little or no risk.
MODERATE	Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution.
UNHEALTHY FOR SENSITIVE GROUPS	Members of sensitive groups may experience health effects. The general public is not likely to be affected.
UNHEALTHY	Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects.
VERY UNHEALTHY	Health alert: everyone may experience more serious health effects.
HAZARDOUS	Health warnings of emergency conditions. The entire population is more likely to be affected.

www.smogwatch.IN.gov
(800) 631-2871

SmogWatch

How does IDEM monitor ozone levels?
IDEM and local air pollution control agencies monitor air quality at 41 ozone monitors located throughout the state.

How does IDEM forecast poor air quality?
Forecasters use current monitor data and weather forecasts to predict ozone levels for the next day. If ozone is forecasted to reach levels that may affect public health, IDEM issues an Air Quality Action Day (AQAD) alert to one or more of the seven SmogWatch regions.

AQAD alerts are similar to thunderstorm or tornado warnings in that the alert is issued to a large area that may be affected. Not all of the area under the forecast may experience poor air quality, but everyone is encouraged to take actions to protect their health and reduce actions that cause ozone.

How do I find out what the current Ozone forecast is?
Indiana's SmogWatch information is available on the Web at www.smogwatch.IN.gov, or by calling (800) 631-2871. For ozone forecasts across the rest of the country, visit U.S. EPA's AirNow Web site at www.airnow.gov .

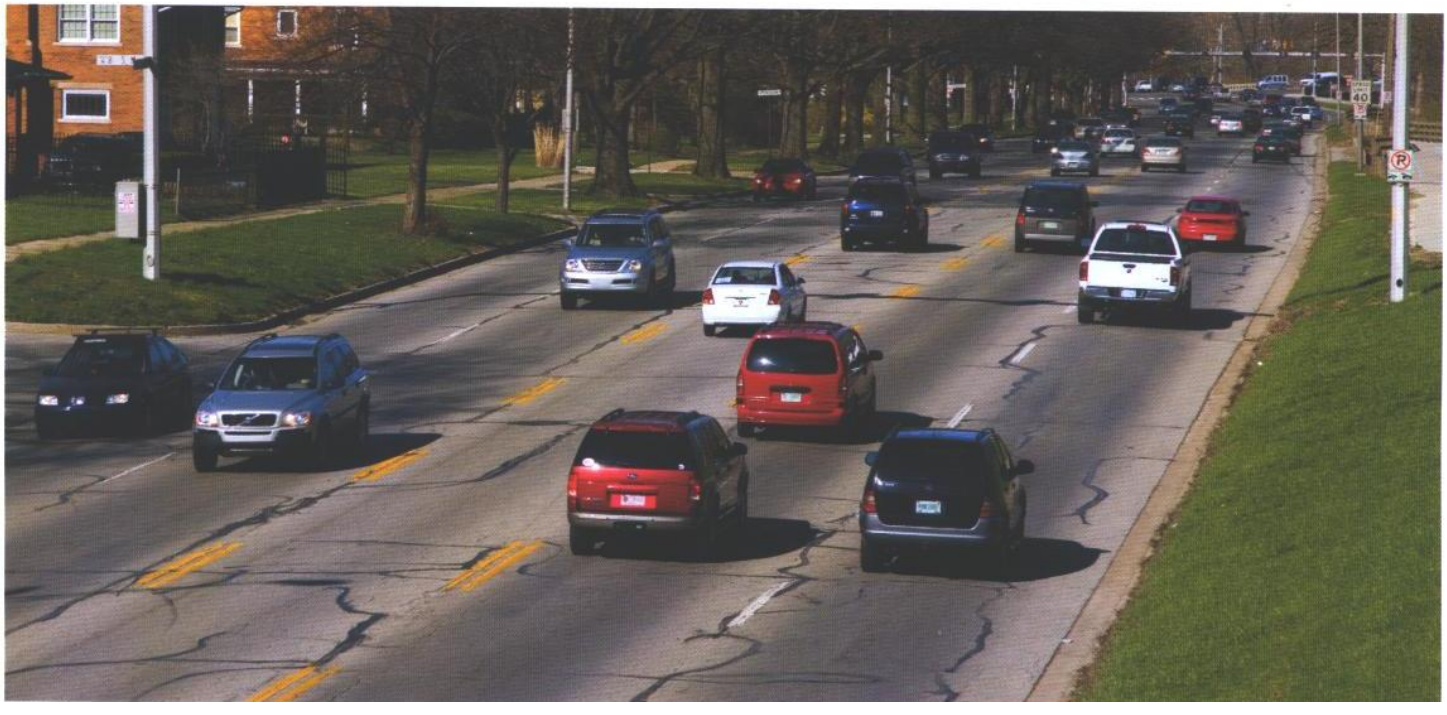
How does IDEM notify the public about AQAD alerts?
AQAD alerts are sent out through a multi-media approach to reach as many Hoosiers as possible. When an AQAD is forecasted, IDEM, the City of Indianapolis, City of Evansville and other air quality partners send out a press release to the local print, radio and television media.

AQAD alerts then appear in the newspaper, on the television, over the radio and even on electronic billboards.

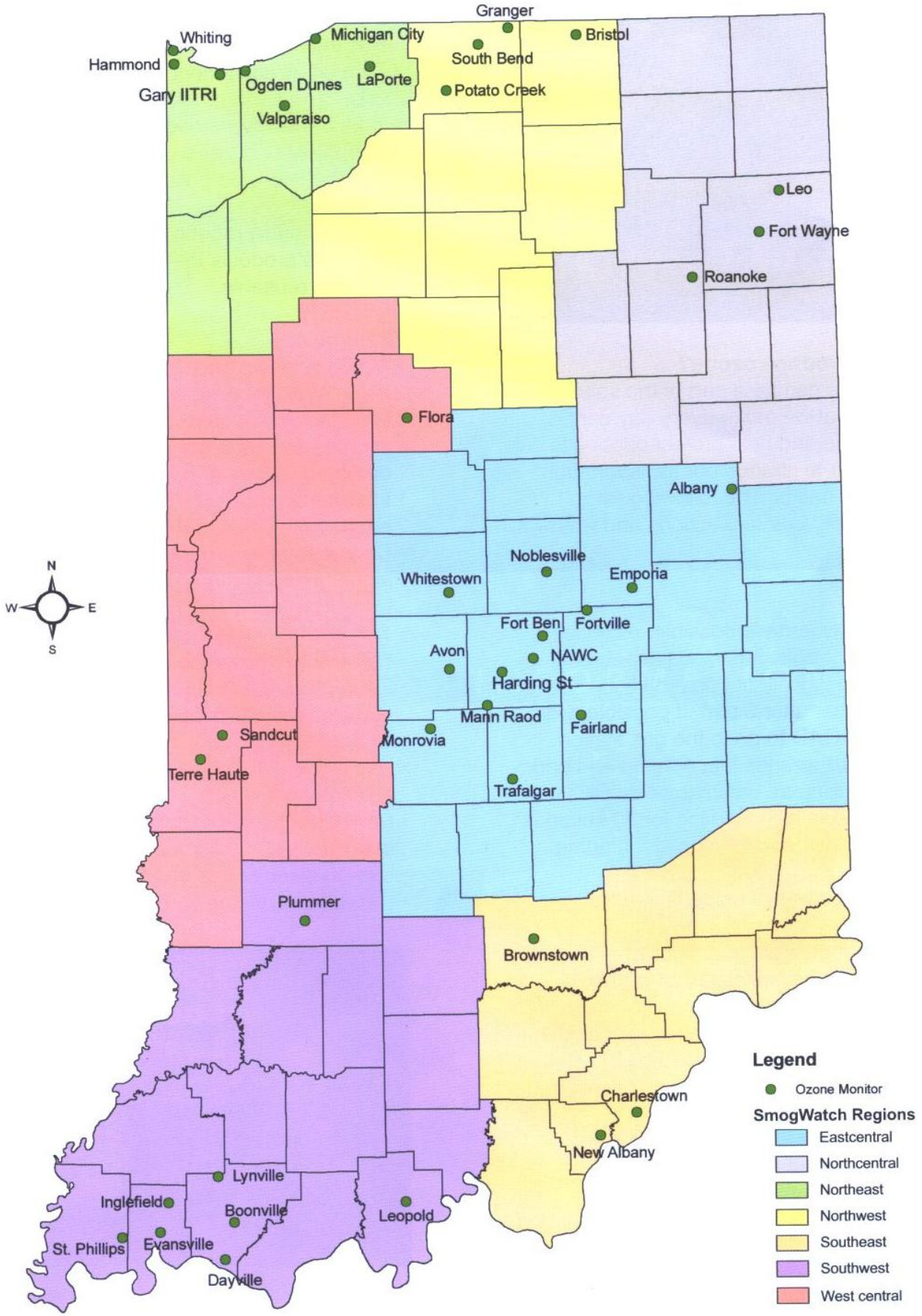
How can I sign up to receive AQAD alerts?
Citizens can receive AQAD alerts by signing up on the SmogWatch Web site at www.smogwatch.IN.gov .

SmogWatch AQAD alerts are sent via e-mail. Check with your local air pollution control agency to see if they send out AQAD alerts as well.

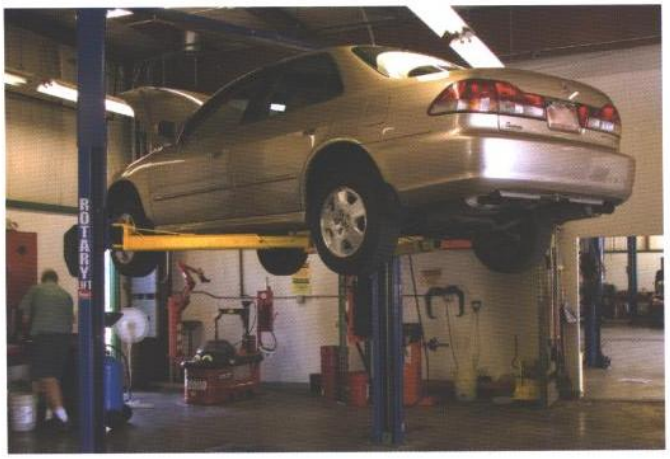
SMOG WATCH
(800) 631-2871
www.smogwatch.IN.gov



Ozone Air Monitoring Stations



Your Actions Count!



How can you reduce ozone?
Each o ne of us can be a part of the solution. The choices that we make every day can decrease ozone and help protect our health. We have the power to change our transportation and consumer habits. The following list suggests simple voluntary actions and ways you can help:

In your car
- Limit driving whenever possible, especially during heavy traffic periods. Use public transit, carpool, walk or ride a bike.
- Refuel your car after 6 p.m. If possible, wait until a non-AQAD to go to the gas station.
- Combine your errands into one trip and park centrally, walking as much as possible.
- Avoid excessive idling. Idling for 30 seconds uses more fuel than stopping and starting your engine.
- Walk inside instead of using drive-thru windows.
- Replace your gas tank cap tightly.
- Keep tires properly inflated and aligned.
- Change air and oil filters regularly.
- Make an appointment with a repair tech if the "check engine light" is illuminated.
- Keep your engine tuned and well maintained.

At work
- Take advantage of any ride-share or carpooling programs.
- Work a flexible schedule and commute during non-peak driving times.
- Telecommute if possible.
- Pack a lunch and eat in or walk to lunch.
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- Buy energy-efficient computers and lighting.
- Turn off all equipment and lights when not in use.
- Take the stairs instead of the elevator.
- Keep fleet vehicles well maintained.
- Adopt office-wide pollution prevention methods.
- Recycle office products.
- Buy new products that have less packaging and are reusable.

At home
- Mow your lawn after 6 p.m. on hot, sunny days. Avoid mowing on Air Quality Action Days.
- Limit the use of gasoline powered equipment such as lawn and garden equipment, tools, outboard motors or off-road vehicles.
- Improve air quality by reducing energy needs from power plants.
- Conserve energy by setting your thermostat higher in the summer and lower in the winter.
- Use energy-efficient lighting and appliances.
- Turn off appliances and lights when not in use.
- Use the microwave to cook small meals.
- Keep air conditioning and refrigeration systems well maintained.
- Check furnace filters monthly.
- Use an electric or gas grill instead of charcoal and lighter fluid.
- Don't burn leaves and yard waste. Mulch them instead.
- Use an electric-powered lawn mower.
- Recycle everything you can.

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